

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A color shift correcting method for correcting a color shift due to misregistration of images in different colors, where a multi-color image is formed by developing latent one-color images written onto respective image carriers by an optical writing device, and directly or indirectly transferring developed one-color images onto a movable element, said method comprising:

adjusting a position at which one of said image carriers is irradiated with an optical beam of a laser light emitting element in a sub-scanning direction to correct said color shift while said optical beam is irradiated from said optical writing device onto said image carriers to develop the latent one-color images, said adjusting including,

writing and developing a one-color pattern on said image carriers;

transferring the one-color patterns developed on said image carriers onto the movable element to form a multi-color pattern on the movable element;

reading ~~[[a]]~~ the multi-color pattern written on said image carriers transferred onto the movable element ~~[[;]]~~ and detecting the color shift among the developed one-color images patterns from the read multi-color pattern with a color shift sensor;

rotating the laser light emitting element, which is rotatably held by a holding member, about a rotational central axis of the holding member to move a laser light emitting position of the laser light emitting element in a sub-scanning direction with an optical axis of the optical beam being inclined with respect to the rotational central axis of the holding member, based on the result of the ~~reading~~ detected color shift obtained from the color shift sensor; and

substantially aligning the rotational central axis of the holding member with the optical axis of the optical beam at a point at which the optical beam is deflected off of a polygon mirror towards one of the image carriers.

Claim 2 (Canceled)

Claim 3 (Currently Amended): The color shift correcting method according to claim 1, further comprising:

setting a write timing at which said multi-color pattern is ~~written~~ formed based on a timing at which a reference point provided on one of said image carriers is detected.

Claim 4 (Currently Amended): The color shift correcting method according to claim 1, further comprising:

setting a write timing at which said multi-color pattern is ~~written~~ formed based on a timing at which a reference point provided on ~~an intermediate transfer~~ the movable element is detected by the color shift sensor.

Claim 5 (Previously Presented): The color shift correcting method according to claim 1, wherein said adjusting further includes:

correcting a write timing at which said optical writing device writes an image; and
correcting the position of the optical beam,

wherein said correcting a writing timing and said correcting the position of the optical beam are executed concurrently.

Claim 6 (Previously Presented): The color shift correcting method according to claim 5, wherein:

said correcting the write timing includes correcting a portion corresponding to a quotient derived by dividing an amount of misregistration by a dot pitch, and

said correcting the position of the optical beam includes correcting a portion corresponding to a residual resulting from the dividing of the amount of misregistration by the dot pitch.

Claim 7 (Withdrawn): An optical writing apparatus, comprising:

optical writing means for irradiating image carriers with optical beams based on input image information and for performing optical writing to form one-color images on each of said image carriers in a plurality of colors; and

adjusting means for adjusting positions at which the optical beams are irradiated onto each of said image carriers, such that the positions match when the one-color images are superimposed.

Claim 8 (Withdrawn): The optical writing apparatus according to claim 7, wherein:

said optical writing means includes a laser light emitting element and a coupling optical system, and said adjusting means comprises a holding member for integrally holding said laser light emitting element and said coupling optical system, and a driving mechanism for moving said holding member in the sub-scanning direction.

Claim 9 (Withdrawn): The optical writing apparatus according to claim 8, further comprising:

an optical housing for holding an optical deflector; and other optics for irradiating said image carriers with an optical beam, said holding member being supported in said optical housing for rotation about an axis such that said holding member is eccentric to an optical axis of the optical beam.

Claim 10 (Withdrawn): The optical writing apparatus according to claim 9, wherein said driving mechanism drives said holding member for rotation about said axis.

Claim 11 (Withdrawn): The optical writing apparatus according to claim 9, wherein said optical axis of the optical beam is eccentric to the axis of rotation of said holding member such that said optical axis of the optical beam matches said axis of rotation of said holding member at an optical beam deflecting position of said optical deflector.

Claim 12 (Withdrawn): An optical writing apparatus according to claim 8, wherein said holding member comprises guide members parallel with the sub-scanning direction of said image carriers in said optical housing, said holding member being supported for movement along said guide members.

Claim 13 (Withdrawn): An optical writing apparatus according to claim 12, wherein said driving mechanism transports said holding member along said guide members.

Claim 14 (Withdrawn): An optical writing apparatus according to claim 12, wherein said guide members have a curvature which is set such that the optical axis of the optical beam substantially matches an optical beam deflecting position of said optical deflector when the optical beam is moved.

Claim 15 (Withdrawn): An image forming apparatus comprising:

- at least one image forming means having an image carrier for forming images in different colors;
- a movable element for directly or indirectly receiving the images formed by said image forming means; and
- an optical writing apparatus including,
 - optical writing means for irradiating image carriers with optical beams based on input image information and for performing optical writing to form images in a plurality of colors, and
 - adjusting means for adjusting positions at which the optical beams are irradiated onto each of said image carriers, such that the positions match when the one-color images are superimposed.

Claim 16 (Withdrawn): The image forming apparatus according to claim 15, further comprising:

- color shift amount detecting means for detecting the amount of color shift based on a plurality of patterns formed on said movable element,
- wherein said adjusting means makes an adjustment, based on the amount of color shift detected by said color shift amount detecting means, to correct a color shift.

Claim 17 (Withdrawn): The image forming apparatus according to claim 15, further comprising:

- a reference position mark provided for detecting a rotating phase of said image carrier; detecting means for detecting said reference position mark; and

processing means for detecting an amount of color shift on a color-by-color basis on said movable element based on a position at which said reference position mark is detected to calculate a color shift correction value corresponding to each of the different colors,

wherein said adjusting means adjusts a position at which the light beam is irradiated on an image carrier corresponding to one of the different colors, based on a detected reference position mark and a plurality of calculated color shift correction amounts, during formation of an image to correct the color shift.

Claim 18 (Withdrawn): The image forming apparatus according to claim 15, further comprising:

a reference position mark provided for detecting a rotating phase on said movable element; detecting means for detecting said reference position mark; and

processing means for detecting an amount of color shift on a color-by-color basis on said movable element based on a position at which said reference position mark is detected to calculate a color shift correction value corresponding to each of the different colors,

wherein said adjusting means adjusts a position at which the optical beam is irradiated on an image carrier corresponding to one of the different colors, based on a detected reference position mark and a plurality of calculated color shift correction amounts, during formation of an image to correct the color shift.

Claim 19 (Withdrawn): The image forming apparatus according to claim 17, wherein said adjusting means comprises: a write timing control circuit for controlling a timing at which the optical beam is irradiated onto each image carrier based on the reference position mark on said image carrier and the plurality of calculated color shift correction values; and a beam position control circuit for controlling a position at which the optical beam is irradiated.

Claim 20 (Withdrawn): The image forming apparatus according to claim 19, wherein:
said write timing control circuit receives a quotient derived by dividing a misregistration amount by a dot pitch, and modulates a laser light emitting element based on the quotient, and said beam position control circuit receives a residual resulting from the division of the misregistration amount by the dot pitch, and moves the optical housing based on the residual.

Claim 21 (Withdrawn): The image forming apparatus according to claim 17, further comprising:
memory means for storing the plurality of color shift correction values; and
reading means for reading the plurality of color shift correction values stored in said memory means.

Claim 22 (Withdrawn): An optical writing apparatus, comprising:
an optical writing device configured to irradiate image carriers with optical beams based on input image information and for performing optical writing to form one-color images in a plurality of colors; and
an adjusting device configured to adjust positions at which the optical beams are irradiated onto each of said image carriers, such that the positions match when the one-color images are superimposed.

Claim 23 (Withdrawn): The optical writing apparatus according to claim 22, wherein said optical writing device includes a laser light emitting element and a coupling optical system, and said adjusting device comprises a holding member for integrally holding said

laser light emitting element and said coupling optical system, and a driving mechanism for moving said holding member in the sub-scanning direction.

Claim 24 (Withdrawn): The optical writing apparatus according to claim 23, further comprising:

an optical housing for holding an optical deflector; and

other optics for irradiating said image carriers with an optical beam, said holding member being supported in said optical housing for rotation about an axis such that said holding member is eccentric to an optical axis of the optical beam.

Claim 25 (Withdrawn): The optical writing apparatus according to claim 24, wherein said driving mechanism drives said holding member for rotation about said axis.

Claim 26 (Withdrawn): The optical writing apparatus according to claim 24, wherein said optical axis of the optical beam is eccentric to the axis of rotation of said holding member such that said optical axis of the optical beam matches said axis of rotation of said holding member at an optical beam deflecting position of said optical deflector.

Claim 27 (Withdrawn): The optical writing apparatus according to claim 23, wherein said holding member comprises guide members parallel with the sub-scanning direction of said image carriers in said optical housing, said holding member being supported for movement along said guide members.

Claim 28 (Withdrawn): The optical writing apparatus according to claim 27, wherein said driving mechanism transports said holding member along said guide members.

Claim 29 (Withdrawn): The optical writing apparatus according to claim 27, wherein said guide members have a curvature which is set such that the optical axis of the optical beam substantially matches an optical beam deflecting position of said optical deflector when the optical beam is moved.

Claim 30 (Withdrawn): An image forming apparatus comprising:

an image forming device having an image carrier for forming images in different colors;

a movable element configured to directly or indirectly receive the images formed by said image forming device;

an optical writing apparatus including an optical writing device for irradiating one-color image carriers with optical beams based on input image information and for performing optical writing to form images in a plurality of colors; and

an adjusting device configured to adjust positions at which the optical beams are irradiated onto each of said image carriers, such that the positions match when the one-color images are superimposed.

Claim 31 (Withdrawn): The image forming apparatus according to claim 30, further comprising:

a color shift amount detecting device configured to detect the amount of color shift based on a plurality of patterns formed on said movable element,

wherein said adjusting device makes an adjustment, based on the amount of color shift detected by said color shift amount detecting device, to correct a color shift.

Claim 32 (Withdrawn): The image forming apparatus according to claim 30, further comprising:

a reference position mark provided for detecting a rotating phase of said image carrier; a detecting device configured to detect said reference position mark; and

a processing device configured to detect an amount of color shift on a color-by-color basis on said movable element based on a position at which said reference position mark is detected to calculate a color shift correction value corresponding to each of the different colors,

wherein said adjusting device adjusts a position at which the light beam is irradiated on an image carrier corresponding to one of the different colors, based on a detected reference position mark and a plurality of calculated color shift correction amounts, during formation of an image to correct the color shift.

Claim 33 (Withdrawn): The image forming apparatus according to claim 30, further comprising:

a reference position mark provided for detecting a rotating phase on said movable element; a detecting device configured to detect said reference position mark; and

a processing device configured to detect an amount of color shift on a color-by-color basis on said movable element based on a position at which said reference position mark is detected to calculate a color shift correction value corresponding to each of the different colors,

wherein said adjusting device adjusts a position at which the optical beam is irradiated on an image carrier corresponding to one of the different colors, based on a detected reference position mark and a plurality of calculated color shift correction amounts, during formation of an image to correct the color shift.

Claim 34 (Withdrawn): The image forming apparatus according to claim 32, wherein said adjusting device comprises:

a write timing control circuit for controlling a timing at which the optical beam is irradiated onto each image carrier based on the reference position mark on said image carrier and the plurality of calculated color shift correction values; and a beam position control circuit for controlling a position at which the optical beam is irradiated.

Claim 35 (Withdrawn): The image forming apparatus according to claim 34, wherein said write timing control circuit receives a quotient derived by dividing a misregistration amount by a dot pitch, and modulates a laser light emitting element based on the quotient, and said beam position control circuit receives a residual resulting from the division of the misregistration amount by the dot pitch, and moves the optical housing based on the residual.

Claim 36 (Withdrawn): The image forming apparatus according to claim 32, further comprising:

a memory device configured to store the plurality of color shift correction values; and a reading device configured to read the plurality of color shift correction values stored in said memory device.

Claim 37 (New): An image forming apparatus, comprising:

an image forming device having one-color image carriers for forming images in different colors;

a movable element configured to directly or indirectly receive the images formed by said image forming device;

an optical writing apparatus including an optical writing device having a laser light emitting element configured to irradiate said image carriers with corresponding optical beams emitted from the laser light emitting element based on input image information and to form images in a plurality of colors;

an adjusting device configured to adjust positions at which the optical beams are irradiated onto said image carriers by the optical writing device, such that the positions match when one-color images from said image carriers are superimposed; and

a color shift amount detecting device configured to detect the amount of color shift based on a plurality of patterns in a plurality of colors formed on said movable element received from said one-color images of said image carriers by the optical writing device, wherein

said adjusting device makes an adjustment, based on the amount of color shift detected by said color shift amount detecting device, to correct a color shift,

said adjusting device includes a holding member configured to rotatably hold the laser light emitting element of the optical writing device and rotate the laser light emitting element about a rotational central axis of the holding member to move a laser light emitting position of the laser light emitting element in a sub-scanning direction with an optical axis of the optical beam being inclined with respect to the rotational central axis of the holding member, based on the result of the color shift detected by the color shift amount detecting device, and

the rotational central axis of the holding member is substantially aligned with the optical axis of the optical beam at a point at which the optical beam is deflected off of a polygon mirror towards one of the image carriers.